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ABSTRACT

Intended to aid the course coordinator in planning and managing a basic training program for emergency medical technicians (EMTs), this course guide is divided into four sections. The introductory section provides a brief overview of the coordinator's responsibilities and identifies the twenty-five lessons included in the course. Section 2 describes the instructional program, including the following elements: work performance addressed by the course, student qualifications, student performance objectives, and course structure and instructional strategy. This section also includes a brief description of each unit. The third section covers the course planning considerations, including suggestions for scheduling the lessons, class size, instructor qualifications, required materials and equipment, and cost estimates. The final section includes suggestions for managing and evaluating the course. (Two separate documents accompany the course guide: a set of instructor lesson plans and a student study guide.) (BM)

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Basic Training Course/ Emergency Medical Technician

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(Second Edition)

Course Guide

1977

U. S. Department of Transportation
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Washington, D. C. 20590

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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Foreword

The National Highway Traffic Safety Administration has assumed responsibility for the development of training programs that are responsive to the standards established by the Highway Safety Act of 1966. Since these training programs are designed to provide national guidelines for training, it is NHTSA's intention that they be of the highest quality and be maintained in a current and up-to-date status from the point of view of both technical content and instructional strategy. To this end, NHTSA supported the current study which involved revision of selected curriculum packages deemed of high value to the States in carrying out their annual work programs.

The original package of the current training program was prepared in 1969 and was titled "Basic Training Program for Emergency Medical Technician—Ambulance." In general, the coverage and design of the revised program reflect that of the original training program. Technical facts have been updated. Detailed outlines of lesson contents are included in the revised **Instructor's Lesson Plans** document. This **Course Guide** has been updated to reflect the revised program and to be more responsive to the specific needs of the course coordinator. A **Student Study Guide** has been prepared as an aid for the student; the original training package had no student guide.

Dr. Aaron Adams of NHTSA's Manpower Development Division served as Contract Technical Manager. Mr. Robert E. Motley of NHTSA's Emergency Medical Services Branch served as project advisor.

NHTSA is indebted to the American Academy of Orthopaedic Surgeons which provided prepublication copies of the second edition of its text on emergency medical care for use in preparing the revised curriculum package. This text, entitled "Emergency Care and Transportation of the Sick and Injured," served as the basic medical reference for the training program.

NHTSA also acknowledges the following individuals who provided critical reviews of draft course materials: Joe E. Acker, III, Tennessee Department of Public Health; Tom Ardrey, Texas Department of Health Resources; Charles P. Barranco, New Jersey Department of Health; Jerry Beckman, University of New Mexico; Austin C. Buchanan, Massachusetts Department of Public Health; David R. Flynn, Indiana Emergency Medical Services Commission; David T. Gold, New Hampshire Division of Public Health, Jacqueline R. Goss, University of Vermont; Alan P. Graham, Santa Fe Community College (Florida); Mavienne Hanson, Itawamba Junior College (Mississippi); Larry Hatfield, University of Kansas; James L. Hendrickson, Utah Department of Social Services; Randall V. Hiatt, Nebraska Department of Health; M. Virginia Kohrmann, Colorado Department of Health; Tyler B. Larson, North Dakota Department of Health; K. J. Lee, Oregon State Health Division; Ernest C. Littlejohn, South Carolina Department of Health and Environmental Control; Robert S. Loud, Nevada Health Division; Duane Lynn, Arizona Department of Public Safety; Anthony P. Marquez, Illinois Department of Public Health; M. M. Matthiesen, Pennsylvania Department of Health; Avery John Menefee, III, Iowa Department of Health; Joseph W. Mikos, Maryland Department of Health and Mental

Introduction

This **Course Guide** has been prepared to aid the course coordinator in planning and managing the **Basic Training Program for Emergency Medical Technicians** (EMT's). The overall objective of the course is to improve the quality of emergency care rendered to victims of accidents and illness. As such, the course develops skills in symptom recognition and in all emergency care procedures and techniques currently considered to be within the responsibilities of an EMT providing emergency medical care with an ambulance service.

The course consists of 25 lessons involving 71 hours of classroom and field training plus 10 hours of in-hospital observation and training for a total program of 81 hours. The titles and times required for each of the 25 course lessons are given on the following page. The specified training times are minimal; actual training time (including clinical experiences) is expected to range from the recommended minimum of 81 hours to 120 hours or more depending on individual state program requirements.

The course coordinator serves as administrator of the training program. He is responsible for program planning, conduct and evaluation. He recruits and screens students. He selects qualified instructors for each lesson and assures that all instructors are thoroughly knowledgeable about their special responsibilities in teaching the course. He plans and schedules all sessions and assures that appropriate facilities and resources are available as needed. He arranges for continuity among sessions and plans and schedules in-hospital training and other appropriate practical experience. He assures the smooth functioning as well as the technical quality of the program and collects and maintains appropriate records to document and evaluate the program. In carrying out these planning and management activities, he must ensure that his training goals are consistent with training needs in his state or area and that he accomplishes these goals within an established budget.

The course coordinator must be not only competent as a manager but also experienced in the field of emergency care and completely knowledgeable about the roles and responsibilities of emergency medical technicians and the constraints under which they work. He may or may not be a physician. If he is a non-physician, a physician should serve as the course medical director with responsibility for certifying that individual students have successfully completed the training course.

The course coordinator requires thorough knowledge of the training program and all documents comprising the curriculum package. In addition, he needs information in the following areas:

Functions which students will be able to perform on the job as a result of successfully completing the course.

Capabilities and characteristics of the student and of the competent EMT. These aid in defining student qualifications for attending the course as well as for successfully completing the course.

Student performance objectives addressed by the course, that is, what the student will be able to demonstrate in the classroom as a result of successfully completing the course. These aid in defining course scope and training time.

Course Lessons

1. Introduction to Emergency Care Training—Course Scope, EMT Functions, Legal Considerations, Anatomy and Physiology, and Vital Signs (3 hrs.)
2. Airway Obstruction and Respiratory Arrest (3 hrs.)
3. Cardiac Arrest (3 hrs.)
4. Mechanical Aids to Breathing and Resuscitation (3 hrs.)
5. Bleeding, Shock and Practice on Airway Care, Pulmonary Resuscitation and Cardiopulmonary Resuscitation (3 hrs.)
6. Practice Test and Evaluation—Airway Care, Pulmonary Arrest, Cardiac Arrest, Bleeding and Shock (3 hrs.)
7. Wounds (3 hrs.)
8. Principles of Musculoskeletal Care and Fractures of the Upper Extremity (3 hrs.)
9. Fractures of the Pelvis, Hip and Lower Extremity (3 hrs.)
10. Injuries of the Head, Face, Neck and Spine (3 hrs.)
11. Injuries to the Eye, Chest, Abdomen and Genitalia (3 hrs.)
12. Practice, Test and Evaluation—Injuries I (3 hrs.)
13. Practice, Test and Evaluation—Injuries II (2½ hrs.)
14. Medical Emergencies I (3 hrs.)—ingested and inhaled poisons, bites and stings, heart attack, stroke, dyspnea
15. Medical Emergencies II (2½ hrs.)—diabetes, acute abdomen, communicable diseases, patients with abnormal behavior, alcohol and drug abuse, epilepsy
16. Emergency Childbirth (2½ hrs.)
17. Environmental Emergencies (2½ hrs.)—burns; exposure to heat, cold and water hazards
18. Lifting and Moving Patients (3 hrs.)
19. Field Exercise: Extrication from Automobiles (3 hrs.)
20. Practice, Test and Evaluation—Medical Emergencies, Emergency Childbirth, Environmental Emergencies, Lifting and Moving (3 hrs.)
21. Operations—Driving and Maintaining an Emergency Vehicle, Records and Reports, Communications, and Procedures at Emergency Departments (3 hrs.)
22. Responding to an Ambulance Call: A Review of Factors Affecting Ambulance Run Efficiency and Patient Assessment (2 hrs.)
23. Situational Review (3 hrs.)
24. Final Written Test (2 hrs.)
25. Final Practical Evaluation of Skills (3 hrs.)

Course structure and instructional strategy.

Resources and facilities required for the course.

Qualifications of the instructional team and tasks that instructors will be required to perform.

Methods of scheduling course lessons; assigning dates, times and personnel as appropriate; and estimating costs.

Suggestions for managing and evaluating program results.

In addition to this introductory section, the **Course Guide** contains the following three sections:

The Instructional Program: This section covers the first four of the above-listed factors, that is, work performance addressed by the course, student qualifications, student performance objectives, and course structure and instructional strategy. It includes a brief description of each course lesson.

Course Planning Considerations: This section covers the fifth, sixth and seventh of the above-listed factors. It includes suggestions for scheduling course lessons; determining class size; instructor qualifications; and required materials, equipment and facilities. It also includes considerations involved in estimating course costs.

Course Management and Evaluation: The final section includes suggestions for managing and evaluating the course.

The **Course Guide**, therefore, has been designed specifically to aid the course coordinator in carrying out his administrative responsibilities relative to the training course. Two other documents complete the training package:

Instructor's Lesson Plans. This document has been designed for use by the course instructors. It contains detailed content outlines, requirements and guidance for teaching each course lesson.

Student Study Guide. This document provides an overview of each course lesson and includes study suggestions to aid students in achieving course objectives.

The Instructional Program

Course Objectives

This course was developed to provide the first phase of training in the career structure of the emergency medical technician (EMT). It covers all techniques currently considered to be within the responsibilities of a basic EMT providing emergency medical care with an ambulance service. Specifically, after successful completion of the program, the student will be capable of performing the following functions:

Recognizing the nature and seriousness of a patient's condition or extent of his injuries to assess requirements for emergency care.

Administering appropriate emergency care to stabilize the patient's condition.

Lifting, moving, positioning and otherwise handling the patient in such a way as to minimize discomfort and further injury.

It is obvious that EMT's provide a service in a special environment requiring special skills and knowledge in such areas as communications, transportation, record keeping, and liaison with other emergency services. The course does not attempt to develop proficiency in these operational aspects of the EMT's job.

The Competent EMT

The EMT represents the first component of the emergency medical care system. The competent EMT recognizes the seriousness of the patient's condition, uses appropriate emergency care techniques and equipment to stabilize his condition, and transports the patient to the hospital. In addition to caring for patients in an emergency, the EMT must deal with the patients' relatives, friends, bystanders, police and other officials, secure the safety of the emergency scene if necessary, observe and preserve evidence as appropriate, plan and carry out procedures to care for patients in wrecked vehicles or other not readily accessible locations and remove them from such locations if necessary, maintain communications with a dispatcher and other emergency personnel, record a variety of information, participate in disaster planning and exercises, maintain his vehicle and equipment in a ready state, and drive the ambulance safely and expertly under all conditions of weather, traffic and terrain.

At all times, the EMT's primary responsibility is to bring expert emergency medical care to the victims of emergencies and to transport them safely and expeditiously to the hospital. The EMT must accomplish these duties unsupervised, in a great variety of circumstances and often under considerable physical and emotional stress. The concept of an emergency medical technician, therefore, is of a person capable of exercising technical skills with authority and good judgment under difficult and stressful conditions. Personal qualities of stability, leadership and judgment are primary.

Course Students

This course has been developed for all individuals desiring to perform emergency medical care with an ambulance service. No prior emergency care experience or training is required of the course applicant. The course scope, duration

and performance objectives reflect this level of knowledge and experience.

Specific student prerequisites for attending the course should be defined by local requirements. These will depend on specific goals established by the course coordinator and the area or organization sponsoring the course.

Course Scope, Performance Objectives and Instructional Strategy

In developing the program, it was determined that the course should include coverage of the following medical conditions: airway problems, cardiac arrest, external and internal bleeding, shock, injuries to all body parts, fractures, dislocations, sprains, poisons, heart attack, stroke, diabetes, acute abdomen, communicable diseases, patients with abnormal behavior, alcohol and drug abuse, the unconscious state, emergency childbirth, burns (chemical, electrical, heat and radiation), emergencies caused by hot and cold environmental conditions and emergencies resulting from water hazards. With regard to **equipment and materials,** it was assumed that, in addition to stretchers, the EMT should be trained to be proficient in using the following: suctioning devices, airways, resuscitation devices, oxygen equipment and delivery systems, sphygmomanometer and stethoscope, splints of all types (including backboards), and dressings and bandages.

As indicated previously, the training course does not develop skill in all job functions that the competent EMT must perform. Rather, it emphasizes the EMT's emergency medical care responsibilities. With these concepts in mind, as well as the preceding assumptions regarding course scope and equipment, the following performance objectives were specified for the training program:

Given a hypothetical ambulance call, the student will:

Describe the roles and responsibilities of the EMT during each phase of an ambulance run

Given a simulated patient (or manikin as appropriate), the student will:

Conduct an examination for illnesses/injuries

Identify any emergency medical conditions

Identify and describe appropriate signs and symptoms

Provide appropriate emergency care

Lift and move the patient to a stretcher and position him appropriately depending on his emergency condition

Given an emergency medical condition, the student will:

Identify and describe signs and symptoms

Describe the cause of the condition

Describe the design, purpose and function of the body parts involved

Indicate priority for triage purposes

Describe appropriate emergency care procedures

Identify any precautions in dealing with the emergency condition

Identify any special legal requirements for dealing with the emergency condition

Given a hospital patient to observe, the student will:

Describe the type and seriousness of the patient's condition

Identify the cause of the condition

Evaluate any known emergency care provided prior to hospital entry

Describe care observed subsequent to hospital entry

The course emphasizes the development of student skill in recognition of signs and symptoms of illnesses and injuries and in proper procedures of emergency care. The instructional strategy postulated for the course is one of learning by doing. Most lessons provide for practice of specific skills and knowledges taught in the lesson. Certain critical skills are practiced in several lessons. In addition, special practice, test and evaluation sessions are interleaved into the program to assure attainment of student proficiency. Furthermore, the course includes 10 hours of in-hospital training and observation to aid students in developing expertise in the emergency medical care field.

Course Design

On the basis of the preceding objectives, scope and instructional strategy, 25 lessons requiring a minimum of 71 hours of training were developed for the emergency care course. Ten hours of in-hospital training bring the total course time to 81 hours. The title, minimum time required and a brief description of each of the 25 lessons follow:

Lesson 1. Introduction to Emergency Care Training (3 hrs.). Overview of course objectives, scope, EMT roles and responsibilities, legal aspects of emergency care, signs and symptoms, and anatomy and physiology.

Lesson 2. Airway Obstruction and Respiratory Arrest (3 hrs.). Basic mechanics of respiration; signs of airway obstruction and respiratory arrest; maintaining an open airway; pulmonary resuscitation; variations for infants, children and laryngectomees.

Lesson 3. Cardiac Arrest (3 hrs.). Basic mechanics of circulation; signs of cardiac arrest; cardiopulmonary resuscitation by a lone rescuer and by a team of rescuers; variations for infants and children

Lesson 4. Mechanical Aids to Breathing and Resuscitation (3 hrs.). Use of airways, suction equipment, oxygen equipment and delivery systems, resuscitation devices.

Lesson 5. Bleeding, Shock and Practice on Airway Care, Pulmonary Resuscitation, and Cardiopulmonary Resuscitation (3 hrs.). Basic mechanics of circulation; determining blood pressure; signs of shock; preventing shock; signs of external and internal bleeding; controlling bleeding; performing an examination for life-threatening problems; taking blood pressure; additional practice on airway care; pulmonary and cardiopulmonary resuscitation; use of mechanical aids to airway care and resuscitation.

Lesson 6. Practice Test and Evaluation—Airway Care, Pulmonary Arrest, Cardiac Arrest, Bleeding and Shock (3 hrs.). Test of knowledges taught thus far; practice on and evaluation of skills taught thus far.

Lesson 7. Wounds (3 hrs.). Anatomy and physiology of the skin, signs and significance of various wound types, basic care of wounds, dressing and bandaging wounds.

Lesson 8. Principles of Musculoskeletal Care and Fractures of the Upper Extremity (3 hrs.). Anatomy and physiology of the musculoskeletal system; definitions and types of fractures and dislocations; signs and symptoms of fractures, dislocations and sprains; examining a patient for injuries; techniques of immobilizing fractures and dislocations of the upper extremity.

Lesson 9. Fractures of the Pelvis, Hip and Lower Extremity (3 hrs.). Signs and symptoms of fractures and dislocations of the pelvis, hip and lower extremity; immobilizing fractures and dislocations of the pelvis, hip and lower extremity; practice in examining a patient for injuries.

Lesson 10. Injuries of the Head, Face, Neck and Spine (3 hrs.). Anatomy and physiology of the nervous system; signs and symptoms of spine fractures; general rules of caring for patients with spine injuries; signs of a skull fracture; caring for patients suffering from injuries to the skull, brain, face and neck; practice in immobilizing patients on short and long backboards.

Lesson 11. Injuries to the Eye, Chest, Abdomen and Genitalia (3 hrs.). Parts and functions of the eye, abdomen, digestive system and genitourinary system; injuries to the eye, chest, abdomen, and genitalia; techniques of care; dressing and bandaging the eye and chest; practice in performing a complete patient examination for life-threatening problems and injuries.

Lesson 12. Practice, Test and Evaluation—Injuries I (3 hrs.). Test of knowledges on injuries to various body parts; practice on and evaluation of skills in dressing and bandaging and performing a patient examination.

Lesson 13. Practice, Test and Evaluation—Injuries II (2½ hrs.). Practice on and evaluation of skills in immobilizing fractures of the upper extremity and lower extremity.

Lesson 14. Medical Emergencies I (3 hrs.). Causes, signs, symptoms and techniques of care for poison victims; victims of bites and stings; heart attack patients; stroke patients; patients suffering from dyspnea; practice in patient assessment; practice in cardiopulmonary resuscitation and using mechanical aids to airway care and resuscitation.

Lesson 15. Medical Emergencies II (2½ hrs.). Causes, signs, symptoms and techniques of care for diabetic patients, patients suffering from acute abdominal problems, patients with communicable diseases, patients with abnormal behavior, alcohol and drug abuse patients, epileptic patients; child patients; practice in patient assessment.

Lesson 16. Emergency Childbirth (2½ hrs.). Relevant anatomy, physiology, terms and emergency care equipment; delivery and care of the baby during normal and abnormal births; resuscitating the newborn; care of the premature infant.

Lesson 17. Environmental Emergencies (2½ hrs.). Estimating the severity of a burn; caring for the burned patient; special dangers of different types of burns (heat, chemical, electrical, radiation); signs, symptoms and techniques of care for the patient suffering from heat cramps, heat exhaustion, heat stroke and frostbite; signs, symptoms and techniques of care for the patient exposed to water hazards.

Lesson 18. Lifting and Moving Patients (3 hrs.). Techniques of lifting and moving patients; immobilizing pa-

tients with suspected spine injuries on short and long backboards; loading and unloading stretchers.

Lesson 19. Field Exercise: Extrication from Automobiles (3 hrs.). Principles and considerations involved in gaining access to and extricating persons from automobiles, packaging and removing patients with suspected spine and other injuries from automobiles; removing patients from beneath automobiles.

Lesson 20. Practice, Test and Evaluation—Medical Emergencies, Emergency Childbirth, Environmental Emergencies, Lifting and Moving (3 hrs.). Test of knowledges on medical emergencies, emergency childbirth, environmental emergencies, and lifting and moving patients; practice on and evaluation of skills in emergency childbirth, lifting and moving, immobilization on long and short backboards and patient assessment.

Lesson 21. Operations—Driving and Maintaining an Emergency Vehicle, Records and Reports, Communications, and Procedures at Emergency Departments (3 hrs.). Overview of EMT procedures and responsibilities in the listed operational areas.

Lesson 22. Responding to an Ambulance Call—A Review of Factors Affecting Ambulance Run Efficiency and Patient Assessment (2 hrs.). Integration of knowledge learned during the course by discussion of considerations involved in phases of an ambulance run; patient examination and assessment; review of vital signs and their implications; triage.

Lesson 23. Situational Review (3 hrs.). Review of course contents by group discussion of situational examples.

Lesson 24. Final Written Test (2 hrs.). Test of knowledges learned in the emergency care course.

Lesson 25. Final Practical Evaluation of Skills (3 hrs.). Evaluation of skills learned in the emergency care course.

From the preceding descriptions, it is apparent that Lesson 1 introduces the student to the course and to the emergency medical technician's job. It is followed by lessons on basic life support (Lessons 2-6); injuries to various body parts (Lessons 7-13); and common medical emergencies, emergency childbirth, environmental emergencies, techniques of lifting and moving patients, and field practice in "packaging" individuals with suspected spine and other injuries and removing them from vehicles (Lessons 14-20). Each of these three lesson blocks or modules has its own practice, test and evaluation session. The operational aspects of the EMT's job are covered in Lesson 21. It is followed by two lessons that provide for an integration of operational and medical knowledge by a discussion of considerations involved in planning an emergency ambulance run, reviews of vital signs and patient examination, and triage (Lesson 22) and a review of field situations that could be encountered by an EMT (Lesson 23). The course concludes with a written test of knowledges (Lesson 24) and a practical evaluation of skills (Lesson 25).

The course provides for an early and continuing emphasis on patient assessment as well as reinforcement of the basic sequence of emergency care procedures. Thus, elements of a primary patient survey for life-threatening problems are introduced in Lessons 2 through 4 and summarized in

Lesson 5; the secondary survey for injuries not threatening to life is introduced in Lesson 8. Both examinations are repeated throughout the training program as are basic emergency care procedures.

As indicated previously, the course includes 10 hours of in-hospital observation and training in order to aid the student in attaining proficiency in various course skills. It is recommended that such training include emergency, surgical, intensive care, obstetrical and psychiatric areas of a hospital. The course coordinator will need to plan this phase of the training program so that the student receives the maximum exposure and benefit from the in-hospital experience. Instruction should be designed to demonstrate the importance and benefits of optimal emergency care, efficient transport, and adequate reporting; to emphasize the penalties of inadequate care or improper procedures; to familiarize the student with the equipment and procedures used in each hospital department; to have ambulance personnel observe procedures in (and, if possible, develop skills in) resuscitation, handling the unconscious, management of the mentally disturbed and unruly, and techniques of delivery and care of both the infant and mother.

Obviously, the course coordinator will need to plan the in-hospital phase of the training in conjunction with the course medical director and representatives of the emergency medical facility. He will need to arrange for the best possible experience and exposure for the student depending on facilities and resources available. It is an important part of the student's training. In addition to providing clinical exposure, it may provide an opportunity for the student to refine his basic emergency care skills under supervision. It can permit the student to observe clinical management of trauma and medical processes, observe continuation of field management and definitive care, and develop interpersonal/interdisciplinary relationships with the hospital staff.

Although not formally part of the training course, it is recommended that the course coordinator arrange, if possible, for students to participate in ambulance calls. In such experiences, students should serve as a third EMT; they should observe the two primary EMT's and assist them as requested.

In the brief time allotted to in-hospital training and participation in ambulance runs (if included in the course), exposure to a variety of cases may be minimal for any one student. It is therefore recommended that the course coordinator include time in the program, if possible, for students to discuss their in-hospital training and ambulance runs. For example, the student who was exposed to a tension pneumothorax could describe his observations of patient condition and management and thereby share his experience with fellow students.

Course Planning Considerations

Course Scheduling

As indicated previously, the course consists of 25 lessons requiring between 2 and 3 hours each plus 10 hours of in-hospital observation and training. The lessons may be given one or more times per week or may be combined into a training day of 5 or 6 hours or more. Regardless of whether the lessons are spread out or given in a compressed time frame, it is recommended that the general sequence of lessons presented in the previous section be followed. The in-hospital training may be interspersed throughout the program or scheduled at or near the completion of classroom training. It is recommended that the entire training program be completed within one year.

It is recognized that meaningful in-hospital training may be difficult to schedule in rural areas where emergency cases at medical facilities may be rare. In such instances, it is recommended that the course coordinator arrange for in-hospital training to take place in an urban setting if possible. In addition, riding as an observer with an urban ambulance would give the rural student an exposure to a variety of emergency medical conditions.

It is recommended that all EMT training be arranged under the sponsorship of the local medical society. In addition, all courses should be coordinated with the appropriate local organization and/or governmental agency with designated responsibility for direction and planning of emergency medical services.

Class Size

As stated previously, the course emphasizes the development of student skill in symptom recognition and emergency care and therefore relies heavily on demonstration and practice as a teaching method. In order that maximum student participation can be achieved in **both** lecture-demonstration periods and practice periods of each lesson, the class size of necessity must be small.

The class size for lecture-demonstration periods must be small enough to allow interaction between student and instructor, permit the instructor to know if his points are getting across and to recognize variations in student ability and knowledge, and permit demonstration of skills to be easily viewed by all students. It is preferable, therefore, that the class size for **lecture-demonstration** periods of each lesson be limited to 20 students. In no case should it exceed 40 students.

Practice periods of each lesson must permit sufficient individual supervised practice for each student to attain skill in the given topic area covered in that lesson. In addition, instructors must be able to observe and evaluate each student's performance. It is essential, therefore, that practice be performed in small groups. The group size for **practice periods** should not exceed 6 students.

The limitations on class size have obvious implications for the number of instructors required for each lesson. The lead instructor for any one lesson will require sufficient instructor aides in order that the student-to-instructor ratio for **practice** will not exceed 6 to 1. Should there be more than 6 students for any given instructor or instructor aide, a proportional increase in time for practice will be required for each lesson.

Instructor Qualifications

The lead instructor for each lesson will be responsible for the lecture-demonstration period of that lesson. He will be assisted as necessary by instructor aides in the practice period of the lesson. Since both the lead instructor **and** the instructor aides will be responsible for developing student skills and for evaluating student attainment of specific skills, they must both exhibit the following characteristics:

Be experienced in the field of emergency care.

Be specialists in the given topic area.

Be skilled in the use and maintenance of all equipment required for the topic area.

Be knowledgeable about legal constraints under which emergency medical technicians operate in the area of emergency care, ambulance and rescue operations, vehicles and equipment, violent cases, procedures for handling the deceased, etc.

Be skilled instructors.

It is recommended that all medical lessons in the course be taught by physicians. Operational lessons should be taught by individuals with extensive experience in the ambulance service area. For instructor aides, maximum use should be made of certified emergency medical technicians and nurses. Instructors for all lessons in which cardiopulmonary resuscitation is taught should be certified by the State Heart Association as CPR instructors.

It is especially important that both the lead instructor and instructor aides for practice, test and evaluation lessons be thoroughly knowledgeable about the information and skills covered in these lessons. The final practical examination of skills should, whenever practical, be conducted by physicians, nurses, and EMT's who have been approved by the State and who have not participated directly with the course. The final practical examination should be supervised by the course coordinator.

Recommended instructors and instructor aides for each lesson are listed on the following pages. It is realized that the recommended instructors may be difficult to obtain, particularly in rural areas where specialists may be lacking and even general practitioners may be unavailable for training courses. In such cases, it is recommended that RN's trained as critical care practitioners be obtained as instructors if possible. In addition, the Department of Transportation has prepared film back-up lessons that may be used when appropriate instructors are unavailable.[1] However, in no case should a film substitute for an instructor. Where films are used, a physician or critical care nurse should be available to reinforce the information presented and answer questions.

The lead instructor must be able to perform the following teaching functions:

Deliver lectures

Lead discussions

Demonstrate and evaluate skills

As appropriate, develop and use instructional aids

[1]Films are available from the National Audiovisual Center, Washington, D. C. 20409

Recommended Instructors and Instructor Aides for Each Lesson

Lesson	Lead Instructor	Instructor Aides
1. Introduction to emergency care training.	A primary course physician.	None required.
2. Airway obstruction and respiratory arrest.	Physician (preferably anethesiologist).	Lay instructor skilled in airway care and pulmonary resuscitation
3. Cardiac arrest.	Physician certified as a CPR instructor.	Lay instructor certified as a CPR instructor.
4. Mechanical aids to breathing and resuscitation.	Physician (preferably anesthesiologist).	Lay instructor skilled in airway care and pulmonary resuscitation.
5. Bleeding, shock, and practice in skills taught in Lesson 2-4.	Physician certified as a CPR instructor and proficient in all skills taught in Lessons 2-4.	Lay instructor certified as a CPR instructor and proficient in all skills taught in Lessons 2-4.
6. Practice, test and evaluation.	Physician certified as a CPR instructor and proficient in all skills taught in Lessons 2-5.	Lay instructor certified as a CPR instructor and proficient in all skills taught in Lessons 2-5.
7. Wounds.	Physician.	Lay instructor skilled in bandaging.
8. Fractures of the upper extremity.	Physician (preferably orthopedic surgeon).	Lay instructor skilled in splinting and patient examination.
9. Fractures of the pelvis, hip and lower extremity.	Physician (preferably orthopedic surgeon).	Lay instructor skilled in splinting.
10. Injuries of the pelvis, face, neck, spine.	Physician.	Lay instructor skilled in immobilizing patients on backboards.
11. Injuries to the eye, chest, abdomen, genitalia.	Physician.	Lay instructor skilled in bandaging and patient examination.
12. Practice, test and evaluation.	Physician proficient in all skills taught in Lessons 7-11.	Lay instructor skilled in bandaging and patient examination.

As appropriate, develop written test items and skill checklists

Instructor aides require expertise only in skill demonstration and evaluation.

Should instructors lack the teaching capabilities specified, it will be necessary for the course coordinator to arrange for a teacher-training course designed to train instructors

Recommended Instructors and Instructor Aides for Each Lesson	Lesson	Lead Instructor	Instructor Aides
	13. Practice, test, and evaluation.	Physician proficient in all skills taught in Lesson 7-11.	Lay instructor skilled in splinting.
	14. Medical emergencies I.	Physician certified as a CPR instructor.	Lay instructor certified as a CPR instructor.
	15. Medical emergencies II.	Physician.	None required.
	16. Emergency childbirth.	Physician (preferably obstetrician).	Lay instructor skilled in teaching childbirth.
	17. Environmental emergencies.	Physician (who may wish to use specialists for topic areas).	None required.
	18. Lifting and moving patients.	Lay instructor experienced in lifting and backboards.	Lay instructor experienced in lifting and backboards.
	19. Field exercise: Extrication from automobiles	Lay instructor experienced in ambulance service area, especially rescue.	Lay instructor experienced in ambulance service area, especially rescue.
	20. Practice, test, and evaluation.	Physician certified as a CPR instructor and proficient in all skills taught in Lessons 14-19.	Lay instructor certified as a CPR instructor and experienced in all skills taught in Lessons 14-19.
	21. Operations.	Lay instructor experienced in ambulance service area.	None required.
	22. Responding to an ambulance call.	Physician knowledgeable in all subjects taught in course, operational and medical.	Lay instructor with special training in examining patients.
	23. Situational review.	Physician—same as 22, above.	None required.
	24. Final written test.	Lesson may be monitored by any instructor associated with the course.	None required.
	25. Final practical evaluation.	Physician proficient in all skills taught in the course.	Lay instructor(s) proficient in all skills taught in the course.

to achieve the specified performance objectives.

The course coordinator should brief all instructors on their roles and responsibilities prior to teaching the course. The briefing should include the following:

The state's EMT training program

The revised course—overall course design, functional training addressed, course objectives

Course documents

Technical coverage of each lesson

Design of a lesson plan

Hints for using the lesson plans—preparing to teach each lesson and teaching tasks involved in each lesson

Responsibilities relative to aiding students in achieving course objectives

Administrative responsibilities relative to the course

Materials and Equipment

There are three types of training materials and equipment required for the course. One is the emergency care equipment and supplies required to train the student to perform the EMT's emergency medical care functions. The second is the standard teaching aid consisting of such items as chalkboards, projectors, screens, films, slides and other equipment and materials used by the instructor to facilitate learning. The third consists of student and instructor texts and reference sources.

The emergency care equipment and material requirements are listed by lesson on the following pages. The course coordinator is advised that the list is minimal and designed to provide a standardized base for the course. Where additional updated equipment is available, the course coordinator should include such equipment in the appropriate course lesson.

With regard to teaching aids, no specific set has been defined for this training course. It is assumed that a chalkboard will be available for each lecture-discussion session. It is recommended that the course coordinator preview the films prepared by the Department of Transportation as back-up teaching aids for the course.[1] The film segment on emergency childbirth shows an actual delivery of a baby under field conditions and would be a most useful adjunct to the lesson on the topic. Other films or slides should be selected at the discretion of the course coordinator and instructor. Appropriate projection equipment and screens should be available for lessons in which films or slides are used. It might be noted that, for teaching anatomy and physiology, it would be helpful to have anatomic charts of each system discussed, as well as skeletons and available models of body parts and systems. A Geiger counter would be helpful for the lesson segment on radiation.

Some handouts recommended for the training course will vary from area to area and therefore will need to be prepared locally. These handouts and the lessons in which they are distributed are as follows:

Course schedule (Lesson 1)

Typical dispatch forms used in the area (Lesson 21)

Typical records and reports used in the area (Lesson 21)

[1]See footnote, page 15.

In addition, of course, written tests will be required for Lessons 6, 12, 20 and 24. These tests will need to be developed by the course coordinator and course instructors. Checklists for evaluating student skills will be required for Lessons 6, 12, 13, 20 and 25. Checklists may be developed from the steps for each skill outlined in the **instructor's lesson plans** document.

All instructors should be provided with the detailed lesson plans from the **instructor's lesson plans** document for their particular topic areas. Sufficient copies of the **student study guide** should be available for each student.

Although the **student study guide** contains many specific facts, it is **not** a text. A standard text or reference source should therefore be chosen for the course. An appropriate text and supplementary reading materials should be selected by the course coordinator or the individual state certifying agency.

The medical content of the current course was based on the following references:

American Academy of Orthopaedic Surgeons. **Emergency care and transportation of the sick and injured** (Second Edition). Chicago, Illinois, 1977.

Standards for cardiopulmonary resuscitation (CPR) and emergency cardiac care (ECC). **JAMA,** Vol. 227, No. 7 (Supplement), February 18, 1974.

Patient-handling procedures were obtained from:

Patient handling manual. Prepared by Dunlap and Associates, Inc., for the U. S. Department of Transportation (DOT-HS-800-504). Available from: U. S. Government Printing Office, Washington, D. C. 1972.

Selected information on drugs was obtained from:

Drugs and their abuse. The American National Red Cross, 1971.

Facilities

The standard facility for the majority of the lessons is a lecture hall with sufficient space for seating a maximum of 40 students, a lecture and demonstration area, and practice areas (one for each 6 students). It is recommended that the standard facility be located at a hospital if possible. If this is not feasible, any convenient place of assembly may be used, e.g., a school.

The facility should be well lit to assure adequate viewing of visual aids and demonstrations. In addition, heating and ventilation of the facility should assure student and instructor comfort.

The lecture area should contain a lectern for lesson plans, notes, and references. A large table should be provided in the lecture area for displaying equipment, medical supplies and training aids and for demonstrating emergency medical procedures. A chalkboard, projection screen, and stand for charts should be located in the lecture area. If possible, light switches should be convenient to the lecture area.

Material and Equipment Requirements for Each Lesson*	Lesson																							
Equipment/Materials	1**	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Adult resuscitation manikin	x	1	1	1	1	1								1											1
Infant resuscitation manikin	x	1	1	1	1	1								1		1									
Antiseptic solution and gauze pads	x	1	1	1	1	1								1		1									1
Stretcher	x		1		1													1							1
Oropharyngeal airway	x			1	1	1								1											
Nasopharyngeal airway	x			1	1	1								1											
Lubricant jelly	x			1	1	1								1											
Portable suction unit	x			1	1	1								1											
Oxygen equipment and delivery system	x			1	1	1								1		1									1
Pocket mask with O_2 inlet valve	x			1	1									1											
Bag-valve-mask resuscitator	x			1	1	1								1											
Demand-valve resuscitator	x			1																					
Sphygmomanometer and stethoscope	x				1	1																			1
Universal dressing	x				x		3				1	3							6						3
Sterile gauze pads	x				x		6				1	3							6						3
Roller bandage	x						6	3				3							6						3
Self-adherent bandage	x						x																		
Occlusive dressing	x						x				1	1													
Triangular bandage	x						x	12	24			3	24						6						24
Tourniquet + bandage set	x				1	1																			
Adhesive tape	x						1				1	1							1						1
Bandage scissors	x						1				1	1													2
Stick to simulate impaled object	x						1																		

The student area should contain tables or chairs with writing surfaces for note taking. Chairs should be arranged for unobstructed visual access to the instructor, demonstration area, screen, etc., and convenient physical access to the practice areas.

Each practice area should be large enough to accommodate 6 students working individually or in varying size groups, as well as the equipment and medical supplies with

Material and Equipment Requirements for Each Lesson*	Lesson																								
Equipment/Materials	1**	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Blanket	x							1	3	3			3					4	2	4					2
Pillow	x							x	1				3												
Short padded splints (set)	x							3	1				3						2						3
Cardboard/ladder/ aluminum splints (set)	x							3	3																
Long padded splints (set)	x								1				2						2						2
Short air splint	x						x	1																	
Long air splint	x								1				1												
Traction splint	x								2				2												2
Short backboard with straps	x									1								1	1	1					1
Long backboard with straps	x								1	1								1	1	1					1
Sling	x																		1						
Cervical collar	x									2								2	1	2					1
Sandbags	x									2								2							
Cotton-tipped applicator	x										x														
Eye protector	x										1	1							1						1
Sterile delivery pack	x															1				1					1
Obstetrical manikin	x															1				1					1
Premature infant carrier	x															1									
Vehicle (wreck)																			1						
Ambulance																		1							

*Numbers in the table are based on 6 students, e.g., if there are 12 students, all numbers in the table should be doubled. An "x" indicates that only 1 of the items is required for the lesson regardless of the number of students. Where 2 items are boxed, either one or the other item may be employed for that lesson.

**Although no equipment is required for Lesson 1, it is recommended that all equipments and materials used in the course be on display in the classroom.

which they will be working. Tables should be provided in the practice area for equipment and supplies and for use during certain procedures.

Sufficient space should be provided for accommodating slide and motion picture projectors, if used.

One lesson (Lesson 19) requires the use of automobiles (wrecks). If possible, the facility for this lesson should be

located indoors to avoid lesson scheduling problems due to inclement weather. A suitable facility might be a local armory, school or garage. In the absence of such facilities, an adjacent parking lot may be employed. The instructor and course coordinator should provide a carefully prepared and hazard-free environment for this lesson.

Estimating Course Costs

Planning considerations covered in this section of the **course guide** can provide the base for estimating costs for arranging for and conducting the training program. Other costs will be incurred in managing and evaluating the program. Specifically, the course coordinator should consider costs associated with the following:

Salaries:

Medical director

Course coordinator

Instructors and instructor aides

Support staff (typing, data collection, records maintenance)

Facilities:

Classroom and associated equipment (tables, chairs, lectern, etc.)

Field training facility

Office space and associated equipment (desks, chairs, files, etc.)

Materials:

Emergency care equipment and supplies

Training aids—slides, films, flip charts, projection equipment and screens, etc., handouts

Documents—**course guide, instructor's lesson plans, student study guides,** texts, supplementary references

Student and instructor recruiting materials, registration forms, data collection forms, records and reports, postage, etc.

Travel and per diem as appropriate:

Medical director

Course coordinator

Instructors and instructor aides

Students

In addition, of course, should training of instructors be required to achieve the specified instructor performance objectives, such costs should be included in estimating overall course costs.

Program Management and Evaluation

Two of the course coordinator's main responsibilities are smooth functioning and evaluation of the training program. He must monitor the various lessons to assure appropriate content coverage, emphasis and procedures as well as to maintain the program on schedule. In addition, he must assure the collection, maintenance and dissemination as appropriate of any records required to document the conduct of the program and to assess how well the course achieves the objectives it was designed to achieve.

Maintaining Records

With regard to records, it is recommended that the course coordinator maintain, as a minimum, information on the following:

Student recruiting procedures and forms.

Instructor recruiting procedures and forms.

Coverage and conduct of the instructor briefing.

Student attendance and performance at each lesson including comments as appropriate regarding need for improvement in skills, knowledge, attitudes or personal habits.

Results of evaluation sessions--grades for each written test and completed checklists for each skill evaluation.

Number and qualifications of students completing the course.

Number and qualifications of students who did not complete the course and the reason for not completing the course if known.

Number and qualifications of the instructional team

Instructor performance.

Description of in-hospital exposure and experience.

Adequacy and availability of facilities and resources.

Costs—total program costs, costs for each program element, cost per student.

The preceding types of information can aid the course coordinator in evaluating each course as it is given and in improving the quality and efficiency of future courses.

Assessing Student Achievement

The training course includes several means for assessing student achievement of performance objectives. As indicated previously, there are four interleaved practice, test and evaluation lessons as well as final examinations. The course coordinator is responsible for development, administration and grading of all written practical examinations. All written examinations should be validated by a responsible agency. With regard to skill examinations, checklists should result in standardized evaluations that utilize appropriate evaluation criteria.

A primary purpose of the course is to make certain that emergency medical technicians learn standardized emergency care procedures. Each student, therefore, must demonstrate attainment of knowledge and skill in each area taught in the course. It is the responsibility of the course coordinator to assure that students attain proficiency in each topic area before they proceed to the next

area. If, after counseling and special practice, a student fails to demonstrate the ability to learn specific knowledges and skills, the course coordinator should not hesitate to fail the student. The level of knowledges and skills attained by a student in the classroom will be reflected in his performance on the job as an emergency medical technician. This is ultimately a reflection on the individual responsible for training.

Student requirements for completing the course are as follows:

Skills—In the area of skills, students either pass or fail. Students must demonstrate proficiency in all skills, not only on the final test, but also in each testing session of selected topic areas. Special makeup sessions may be provided as appropriate.

Knowledges—In this area, students must receive a passing grade, not only on the final test, but also on selected tests of topic areas. Special makeup sessions may be provided as appropriate.

Personal attitude—Each student must demonstrate conscientiousness and interest in the course. Students who fail to do so should be counseled while the course is in progress so that they may be given the opportunity to develop and exhibit the proper attitude expected of an emergency medical technician.

Personal appearance—Each student should be neat, clean and well groomed at each session. Students who fail to exhibit good personal hygiene habits should receive special counseling while the course is in progress in order that they may be given the opportunity to correct their personal habits.

Attendance—Students should be required to attend all lessons. At the discretion of the course coordinator, a lesson may be missed if the student can successfully demonstrate attainment of all skills and knowledges covered in that lesson. One-hundred percent attendance is required at all practice, test, and evaluation sessions, as well as the final test. At the discretion of the course coordinator, special makeup sessions may be provided for slow learners or for students who miss tests for valid reasons.

In-hospital training—Prior to certification of course completion, 10 hours of in-hospital observation and training are required. Two consecutive hours are required at any one period.

The ultimate indication of the effectiveness of the program, of course, is how the student performs on the job. If at all possible, the course coordinator should include assessments of subsequent patient care provided by each student in his course evaluation plan.